REMARKS

Allowable Subject Matter

Applicants appreciate the Examiner's acknowledgement that claims 42, 43, 46, and 49 remain allowable. 12/7/05 Office Action, page 6, first paragraph.

Claim Amendments

Claim 13 has been amended to recite that "preparing the capped poly(arylene ether) further comprises precipitating the capped poly(arylene ether) by adding a solution of the poly(arylene ether) to isopropanol". Support for this amendment may be found, at least, in claims 17 and 20 as filed.

For consistency with claim 13, from which it directly depends, claim 12 has been amended to recite that the uncapped poly(arylene ether) "further comprises an uncapped poly(arylene ether) comprising repeating structural units" having the specified structure.

Claim Rejection Under 35 U.S.C. § 102(b) over Yeager

Claims 2-7, 9-18, 24-32, 35-37, 40, 44, and 47 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by U.S. Patent No. 6,352,782 to Yeager et al. ("Yeager"). 12/07/05 Office Action, page 2, third paragraph. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as amended.

Yeager generally describes a resin composition comprising (1) a reactively endcapped poly(phenylene ether) and (2) a curable unsaturated monomer composition. Yeager abstract. Yeager mentions methanol precipitation of a methacrylate-capped polyphenylene ether. Yeager, col. 15, line 37. As acknowledged by the Examiner, methanol is the only precipitation solvent mentioned by Yeager. 12/7/05 Office Action, page 3, last paragraph.

Applicants respectfully assert that their independent claim 13 is not anticipated by Yeager because Yeager does not teach the claim 13 limitation of preparing a capped poly(arylene ether) by a method that comprises "precipitating the capped poly(arylene ether) by adding a solution of the poly(arylene ether) to isopropanol". Anticipation requires that all of the limitations of the claim be found within a single prior art reference. *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir. 1991). As explained above, claim 13 has been amended to include the limitation, "wherein preparing the capped poly(arylene ether) further comprises precipitating the capped poly(arylene ether) by adding a solution of the poly(arylene ether) to isopropanol". Yeager does not teach precipitation of a capped poly(arylene ether) in isopropanol. The Examiner has acknowledged as much: "Yeager only expressly discloses the utilization of methanol as an antisolvent". 12/7/05 Office Action, page 3, last paragraph. Because Yeager does not teach all the limitations of claim 13, Yeager cannot anticipate claim 13. Given that claims 17 and 18 have been canceled without prejudice, and given that claims 2-7, 9-12, 14-16, 24-32, 35-37, 40, 44, and 47 each include or further limit all the limitations of claim 13, they, too, are not anticipated by Yeager. Accordingly, Applicants respectfully request the reconsideration and withdrawal of the rejection of claims 2-7, 9-16, 24-32, 35-37, 40, 44, and 47 under 35 U.S.C. § 102(b) over Yeager.

Claim Rejection Under 35 U.S.C. § 103(a) over Yeager

Claims 33 and 34 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Yeager. 12/07/05 Office Action, page 3, second paragraph. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as amended.

Applicants respectfully assert that claims 33 and 34 are patentable over Yeager because Yeager does not teach or suggest "precipitating the capped poly(arylene ether) by adding a solution of the poly(arylene ether) to isopropanol". For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Establishing a prima facie case of obviousness requires that all limitations of the claim be taught or suggested by the prior art. *See, e.g.*, MPEP 2143.03; *CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003); *In re Royka*, 490 F.2d 981, 985 (C.C.P.A. 1974). Yeager does not teach or suggest the claim 13 limitation, "wherein preparing the capped poly(arylene ether) further comprises precipitating the capped poly(arylene ether) by adding a solution of the poly(arylene ether) to isopropanol". Claims 33 and 34 incorporate this limitation via their ultimate dependence from claim 13. Yeager thus does not teach or suggest all limitations of claims 33 and 34, and Yeager therefore cannot support a prima facie case of obviousness against claims 33 and 34. Accordingly, Applicants respectfully request the reconsideration and withdrawal of the rejection of claims 33 and 34 under 35 U.S.C. § 103(a) over Yeager.

Claim Rejection Under 35 U.S.C. § 103(a) over Yeager + Ueno + Fischer + Kosono

Claims 38 and 39 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Yeager in view of U.S. Patent Application Publication No. 2002/0022695 of Ueno et al. ("Ueno"), U.S. Patent Application Publication No. 2003/0199605 of Fischer ("Fischer"), and International Patent Application No. WO 02/094897 A1 of Kosono et al. ("Kosono"; stated to be equivalent to U.S. Patent Application Publication No. 2004/0158006 A1 of Kosono et al.). 12/07/05 Office Action, page 4, second full paragraph. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as amended.

Yeager is discussed above. Recall that Yeager does not teach or suggest the claim 13 limitation, "wherein preparing the capped poly(arylene ether) further comprises precipitating the capped poly(arylene ether) by adding a solution of the poly(arylene ether) to isopropanol".

Ueno generally describes a polymerizable unsaturated polyester resin composition. Ueno abstract. As acknowledged by the Examiner, Ueno's compositions do not include poly(arylene ether) resins of any kind. 12/7/05 Office Action, page 5, first paragraph.

Fischer generally describes endodontic sealant compositions and methods for sealing a root canal using sealant or other filling materials. Fischer abstract. As acknowledged by the Examiner, Fischer's compositions do not include poly(arylene ether) resins of any kind. 12/7/05 Office Action, page 5, first paragraph.

Kosono generally describes a curable unsaturated resin composition comprising (A) a polymerizable unsaturated resin having two or more polymerizable unsaturated double bonds per molecule, (B) a hydroxyalkyl (meth)acrylate, and (C) an unsaturated compound which has one or more cyclohexene rings and two or more allyl ether groups per molecule and is liquid at ordinary temperature. Kosono abstract. As acknowledged by the Examiner, Kosono's compositions do not include poly(arylene ether) resins of any kind. 12/7/05 Office Action, page 5, first paragraph.

Applicants respectfully assert that claims 38 and 39 are patentable over Yeager in view of Ueno, Fischer, and Kosono because the cited references collectively fail to teach or suggest "precipitating the capped poly(arylene ether) by adding a solution of the poly(arylene ether) to isopropanol".

As noted above, Yeager does not teach or suggest the claim 13 limitation, "wherein preparing the capped poly(arylene ether) further comprises precipitating the capped poly(arylene ether) by adding a solution of the poly(arylene ether) to isopropanol". Claim 38 includes this limitation via direct dependence from claim 13, while and 39 incorporates it expressly. Ueno, Fischer, and Kosono, none of which even mention a poly(arylene ether), do not remedy the failure of Yeager to teach this limitation. The cited references thus collectively fail to teach or suggest all limitations of claims 38 and 39, and the cited references therefore cannot support a prima facie case of obviousness against claims 38 and 39. Accordingly, Applicants respectfully request the reconsideration and withdrawal of the rejection of claims 38 and 39 under 35 U.S.C. § 103(a) over Yeager.

Claim Rejection Under 35 U.S.C. § 103(a) over Yeager + (Blubaugh or Hedtmann-Rein or Weber)

Claims 19 and 20 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Yeager in view of U.S. Patent No. 5,194,517 to Blubaugh et al. ("Blubaugh"), U.S. Patent No. 5,171,825 to Hedtmann-Rein et al. ("Hedtmamn-Rein"), or U.S. Patent No. 5,998,533 to Weber et al., ("Weber"). 12/07/05 Office Action, page 3, fourth paragraph. The rejection is moot in view of the present cancellation of claims 19 and 20. Nevertheless, in order to expedite prosecution and in view of the incorporation of the substance of the claim 20 limitation into claim 13, Applicants wish to preemptively rebut any possible future suggestion that claim 13 is obvious over the cited reference combination.

Yeager is discussed above.

Blubaugh generally describes capped polyphenylene ethers prepared by reaction of a polyphenylene ether with epoxy materials in methods that result in low levels of alkali metal ions and ammonium ions in the resulting product. Blubaugh abstract. The Examiner has referred specifically to column 9, lines 53-55 of Blubaugh, which describe precipitation of a triazine-capped polyphenylene ether with a non-solvent such as "methanol, 1-propanol, acetone, acetonitrile and mixtures thereof". 12/7/05 Office Action, page 4, first full paragraph. The triazine-capped polyphenylene ethers are prepared by reaction of polyphenylene ether with a chlorotriazine compound, and the reaction mixture to be combined with non-solvent is an interfacial reaction mixture containing water, a water soluble basic reagent, an organic liquid, and a phase transfer catalyst. Blubaugh, column 9, lines 17-35. Blubaugh does not teach precipitation with isopropanol.

Hedtmann-Rein generally describes a process for preparing polyphenylene ethers from monohydric phenols by oxidative coupling with oxygen-containing gases in the presence of an oxidation catalyst and particular electrically conducting carboxamide salts. Hedtmann-Rein abstract. The Examiner has specifically referred to column 5, lines 4-28 of Hedtmann-Rein, which describe isolation of an uncapped polyphenylene ether by precipitation on combination of the reaction solution with an alcohol that may be methanol, isopropanol, propanol, or ethanol. 12/7/05 Office Action, page 4, first full paragraph. Hedtmann-Rein does not describe preparation or isolation of capped polyphenylene ethers of any kind.

Weber generally describes a process for the preparation of anhydride-terminated polyarylene ethers. Weber abstract. The Examiner has specifically referred to column 10, lines 31-35 of Weber, which describe precipitation of the reaction products by precipitation in a nonsolvent such as methanol, ethanol, propanol, or isopropanol. 12/7/05 Office Action, page 4, first full paragraph. Weber does not describe the preparation of poly(arylene ether)s capped via reaction with anhydrides, nor does Weber describe the isolation of such capped poly(arylene ether) resins.

Applicants respectfully assert that their claim 13 is patentable over Yeager in view of Blubaugh, Hedtmann-Rein, or Weber because the working examples in Applicants' specification demonstrate that the efficacy of the claim 13 precipitation limitation depends not only on the identity and quantities of the solvent, antisolvent, and polymer, but also on how these materials are combined. Apparently as a summary of all the art-based rejections in the office action, the Examiner made the following statement:

> In summary, it appears to the Examiner that Applicant has merely identified a new property not previously disclosed in describing a known composition. The claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254, 195 USPA 430, 433 (CCPA 1977). Were Applicants to allege that the same level of purity in the PAE component is not realized by isolation methods disclosed by *Yeager*, they should also furnish empirical evidence of this fact in the form of a 132 declaration. In essence, it would be necessary for them to illustrate that it is not only important that the polymer be precipitated from an alcohol antisolvent, but also that the precipitation must be carried out in a specific fashion to ensure sufficient removal of the anhydride and amine components. (That is, they need to demonstrate that the efficacy of the precipitation as an isolation means does not depend on the identity and quantities of the solvent, antisolvent, and polymer alone, but also on how these materials are combined.)

12/7/05 Office Action, page 5, second paragraph (emphasis added). Applicants note that claim 13 has been amended to require that that "preparing the capped poly(arylene ether) . . . comprises precipitating the capped poly(arylene ether) by adding a solution of the poly(arylene ether) to isopropanol". Thus, claim 13 now specifies a compositionally and procedurally limited process for precipitation of the capped poly(arylene ether). Furthermore, Applicants' working examples specifically show that this process is markedly superior to other processes in its ability to reduce the concentration of residual capping agent in the isolated capped poly(arylene ether). In particular, Applicants wish to call the Examiner's attention to the description of Preparative Examples 3-9 at paragraphs [0051] to [0054] and Table 1 of the specification as filed. Those working examples compared residual levels of the capping agent methacrylic anhydride in precipitated capped poly(arylene ether) as a function of the precipitation antisolvent (methanol vs. isopropanol vs. acetone vs. methyl ethyl ketone) and method of addition ("normal" addition corresponding to addition of poly(arylene ether) solution to antisolvent vs. "reverse" addition corresponding to addition of antisolvent to poly(arylene ether) solution). The results were given in Table 1, which is reproduced below with added emphasis in bold type.

Table 1

	Prep. Ex. 3	Prep. Ex. 4	Prep. Ex. 5	Prep. Ex. 6
Precipitation Method	**normal**	**normal**	**normal**	**normal**
Antisolvent	**methanol**	**isopropanol**	**acetone**	**MEK**
Yield (%)	97.3	99.1	64.3	30.9
M_n (AMU)	2,822	3,051	4,345	6,144
M_w (AMU)	7,024	7,191	8,832	11,949
M_n/M_w	2.49	2.36	2.03	1.94
Toluene (ppm)	30,711	31,111	25,612	23,595
Methacrylic acid (ppm)	7,524	6,365	9,595	8,467
Methacrylic anhydride (ppm)	**57**	**5**	**50**	**850**
DMAP (ppm)	371	242	485	258
Methanol (ppm)	ND	--	--	--
Isopropanol (ppm)	--	19,846	--	--
Acetone (ppm)	--	--	ND	--

ND = not detected (less than 10 ppm for methanol, 100 ppm for isopropanol, and 100 ppm for acetone)

Table 1 (cont.)

	Prep. Ex. 7	Prep. Ex. 8	Prep. Ex. 9
Precipitation Method	**reverse**	**reverse**	**reverse**
Antisolvent	**methanol**	**isopropanol**	**acetone**
Yield (%)	97.7	98.2	70.3
M_n (AMU)	3,098.7	3,213.3	4,099.7
M_w (AMU)	7,172.7	7,202.3	8,769.7
M_n/M_w	2.31	2.24	2.14
Toluene (ppm)	4,174	4,418	38,358
Methacrylic acid (ppm)	1,229	2,097	7,809
Methacrylic anhydride (ppm)	**185**	**177**	**75**
DMAP (ppm)	738	504	522
Methanol (ppm)	ND	--	--
Isopropanol (ppm)	--	ND	--
Acetone (ppm)	--	--	352

ND = not detected (less than 10 ppm for methanol, and 100 ppm for isopropanol)

Note that Preparative Example 4, corresponding to addition of the poly(arylene ether) solution to isopropanol, exhibits much lower residual methacrylic anhydride than any other sample. For example, the 5 parts per million (ppm) of methacrylic anhydride in that sample is over ten times lower than that achieved by addition of the same poly(arylene ether) solution to methanol (57 ppm, Prep. Ex. 3) and over thirty-five times lower than that achieved by addition of isopropanol to the same poly(arylene ether) solution (177 ppm, Prep. Ex. 8). Applicants have therefore demonstrated that the efficacy of the precipitation procedure of claim 13 does not depend only on the compositions of the poly(arylene ether) solution and antisolvent, but also on how these materials are combined. The cited references provide no expectation of the remarkable success of this very specific isolation procedure.

Applicants thus respectfully assert that claim 13 is patentable over Yeager, Blubaugh, Hedtmann-Rein, and Weber.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 07-0868 maintained by Assignee.

Respectfully submitted,

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